

An Energy-Efficient LoRa Multi-Hop Protocol
through Preamble Sampling for Remote Sensing
– Simulation Results –

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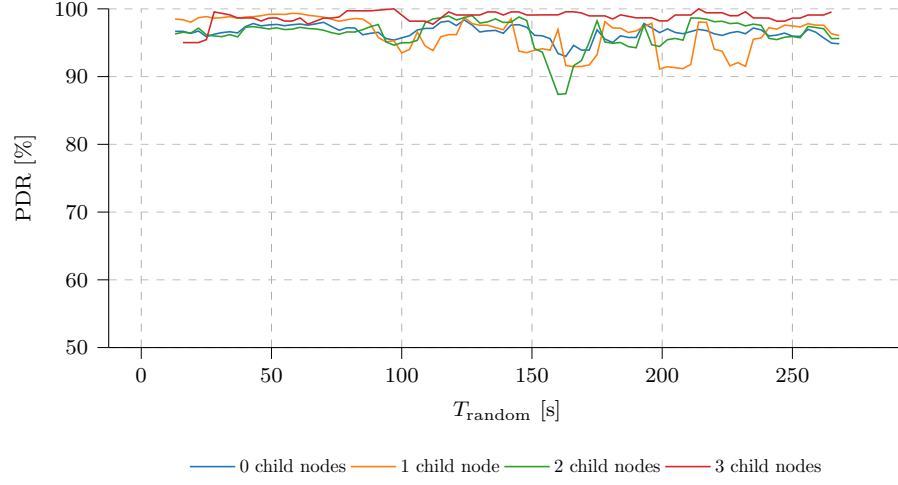


Figure 1: Simulated packet delivery ratio (PDR) across the multi-hop network w.r.t. the added random timer interval (T_{random}).

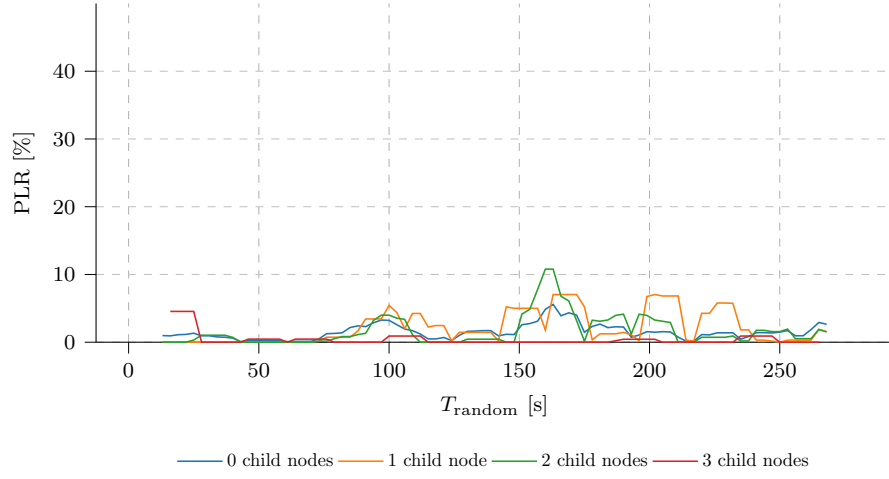


Figure 2: Simulated packet loss ratio (PLR) by collisions across the multi-hop network w.r.t. the added random timer interval (T_{random}).

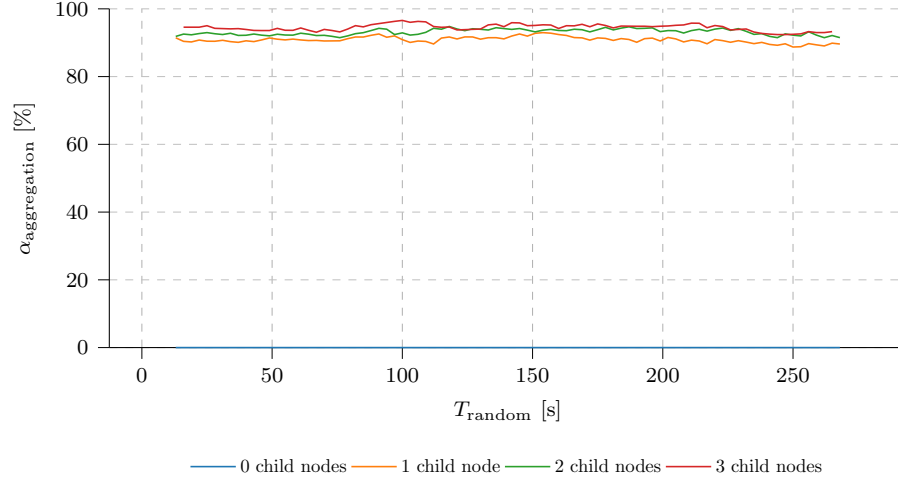


Figure 3: Simulated Simulated aggregation ratio $\alpha_{\text{aggregation}}$ across the multi-hop network w.r.t. the added random timer interval (T_{random}).

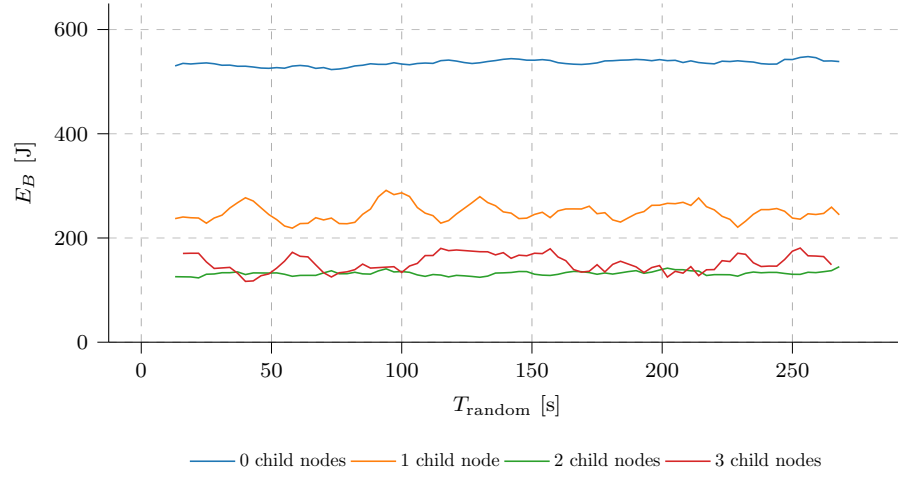


Figure 4: Simulated energy per byte (E_B across the multi-hop network w.r.t. the added random timer interval (T_{random}).

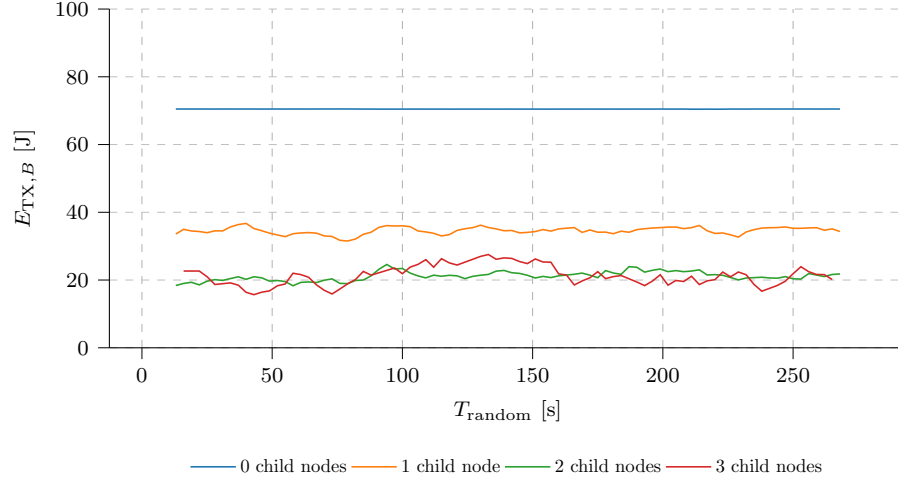


Figure 5: Simulated transmit energy per byte ($E_{TX,B}$ across the multi-hop network w.r.t. the added random timer interval (T_{random}).

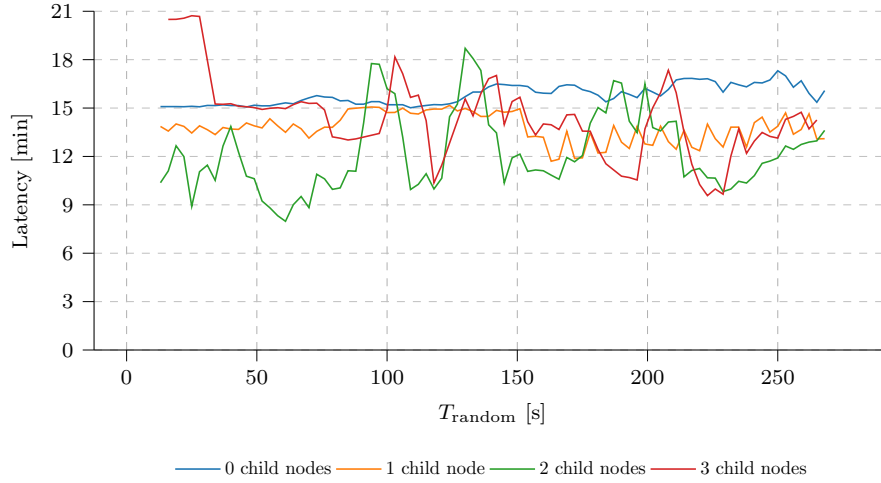


Figure 6: Simulated latency of sensor readings across the multi-hop network w.r.t. the added random timer interval (T_{random}).

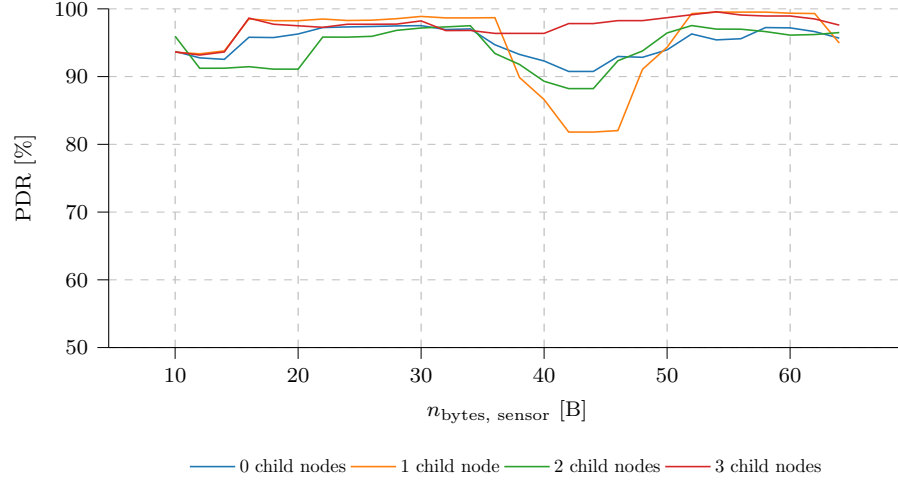


Figure 7: Simulated packet delivery ratio (PDR) across the multi-hop network w.r.t. the data size of one sensor value ($n_{\text{bytes, sensor}}$).

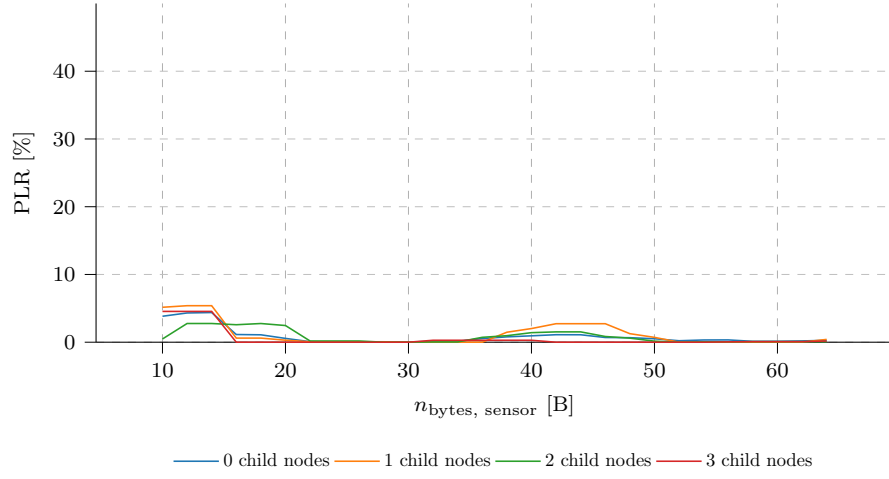


Figure 8: Simulated packet loss ratio (PLR) by collisions across the multi-hop network w.r.t. the data size of one sensor value ($n_{\text{bytes, sensor}}$).

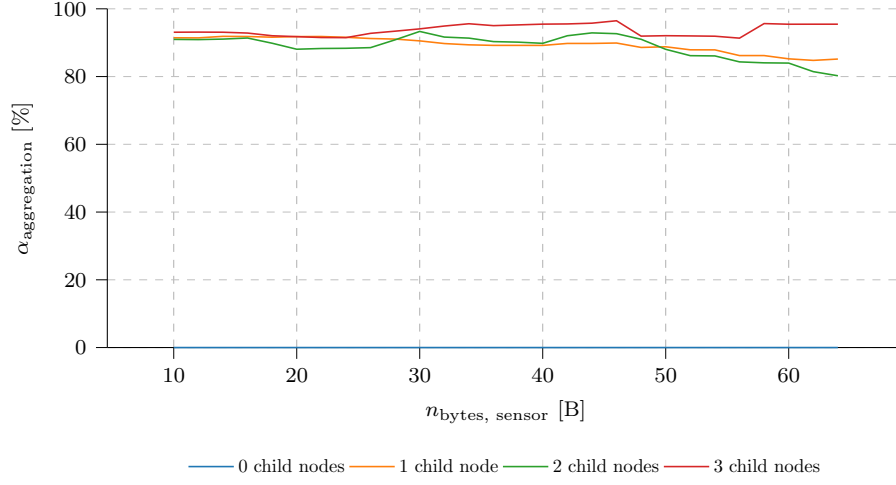


Figure 9: Simulated Simulated aggregation ratio $\alpha_{\text{aggregation}}$ across the multi-hop network w.r.t. the data size of one sensor value ($n_{\text{bytes, sensor}}$).

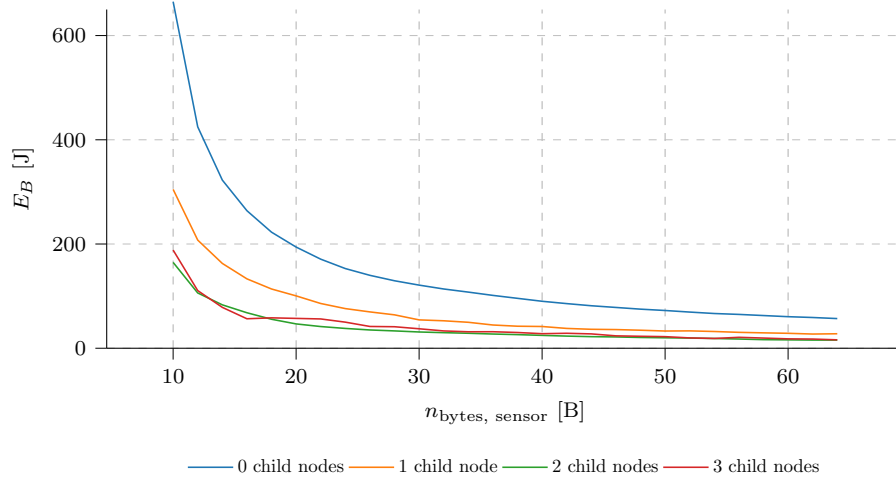


Figure 10: Simulated energy per byte (E_B across the multi-hop network w.r.t. the data size of one sensor value ($n_{\text{bytes, sensor}}$).

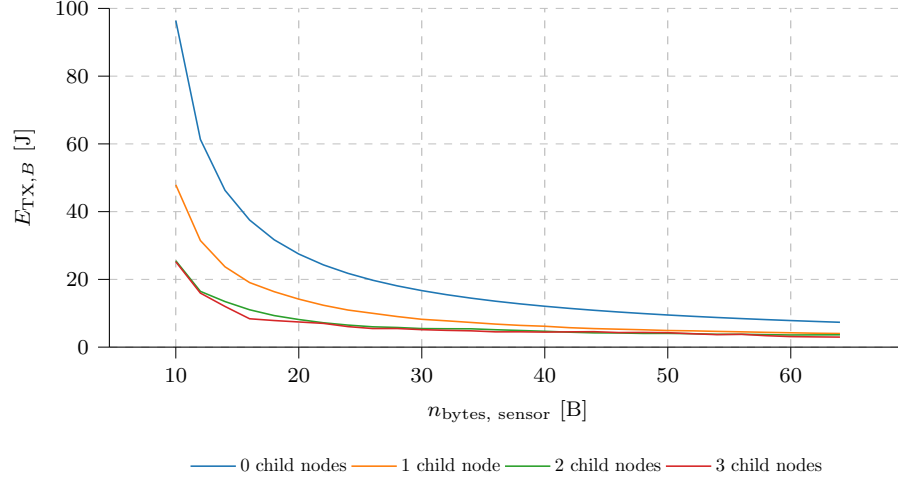


Figure 11: Simulated transmit energy per byte ($E_{\text{TX},B}$ across the multi-hop network w.r.t. the data size of one sensor value ($n_{\text{bytes, sensor}}$).

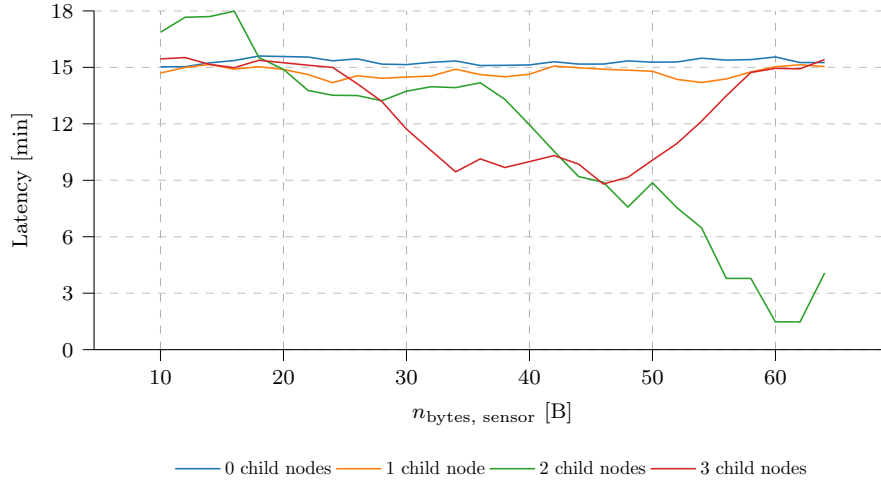


Figure 12: Simulated latency of sensor readings across the multi-hop network w.r.t. the data size of one sensor value ($n_{\text{bytes, sensor}}$).